

ABSTRACT

BACKGROUND: Diabetes Mellitus is one of the common risk factors for end organ damage. Altered metabolic state due to persistent hyperglycemia may produce oxidative stress and membrane dysfunction of red cells which produce impact on haemorheological factors to cause macrovascular and microvascular complications. Many studies have proven an association between haematological alterations in diabetic patients and vascular pathogenesis as well as haematocrit values and insulin resistance. The aim of our study is to estimate the prevalence of red cell morphology changes and their correlation with markers of microvascular complications like Diabetic nephropathy and Diabetic Retinopathy.

MATERIALS AND METHODS: This was a descriptive and prospective study conducted at Government Mohan Kumaramangalam Medical College Hospital, Salem during December 2015 to June 2017. The sample size was 100 patients who were recruited from Diabetology Department and evaluated by taking a detailed history, clinical examination and laboratory investigations. Peripheral smear study, urine spot PCR and Fundus changes were assessed in all patients.

INCLUSION CRITERIA:

1) Type 2 DM patients, 2) Age 30 to 60 years, 3) Both sex.

EXCLUSION CRITERIA:

1) Pregnancy and lactating women, 2) congenital haematological disorders, 3) Known Hypertensives, 4) Known Haematological malignancy, 5) History of Blood transfusion during last 3 months, 6) Other systemic illness, 7) Patients on steroids, antiplatelets and haematinics.

RESULTS: In our study 69 patients out of 100 showed morphological changes in RBCs in the form of change in shape of RBCs like Target cells (codocytes), dacryocytes, schizocytes, and other shapes as well as in variations in size mostly in the form of microcytes and hypochromia. 58 patients showed evidence of Diabetic Retinopathy in the form of Dot blot haemorrhages, cotton wool spots, microaneurysms as well as hard exudates in some of the patients. The multivariate statistical analysis shows an association between morphological changes of RBCs and presence of diabetic nephropathy and diabetic retinopathy. The changes were mostly observed in patients having diabetes of more than 5 years.

CONCLUSION : The results show that there were significant morphological alterations in Red cells of diabetic patients who also showed a significant evidence of microalbuminuria and features of diabetic Retinopathy. The etiopathogenetic factor could be the conformational changes in RBCs which may affect the flow properties at capillary beds resulting in end organ damage. Hence our findings suggest the need for routine screening of peripheral smear study in Type 2 Diabetes Mellitus during clinical assessment of microvascular complications.

KEYWORDS: Diabetes Mellitus, Haematological alterations, peripheral smear, microalbuminuria, Urine spot PCR, Diabetic Retinopathy, Diabetic Nephropathy.